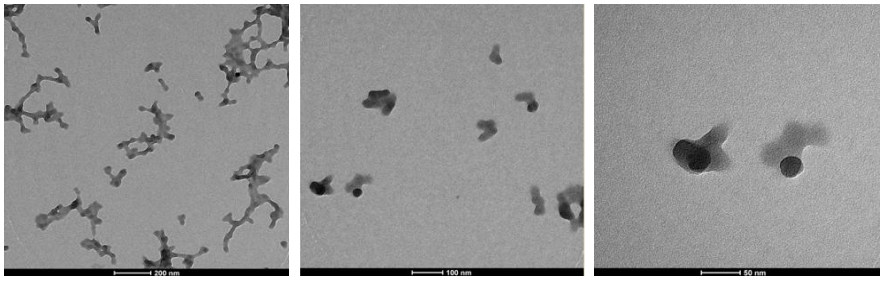
February 2025

OrChESTRA – Organ-on-a-chip Focused Strategic Partnership

Newsletter

Issue: 2025/2

Welcome to the second issue of our OrChESTRA newsletter! As we step into February, we are excited to share the latest updates and progress with you. Our efforts continue to push the boundaries of innovation, from refining materials for biomedical applications to enhancing our design methodologies.
In this edition, we highlight the synthesis of tailor-made molecularly imprinted polymers (MIPs) for dopamine detection and the development of a fluidic circuit board (FCB) integrating cell chip and electrochemical sensor modules.

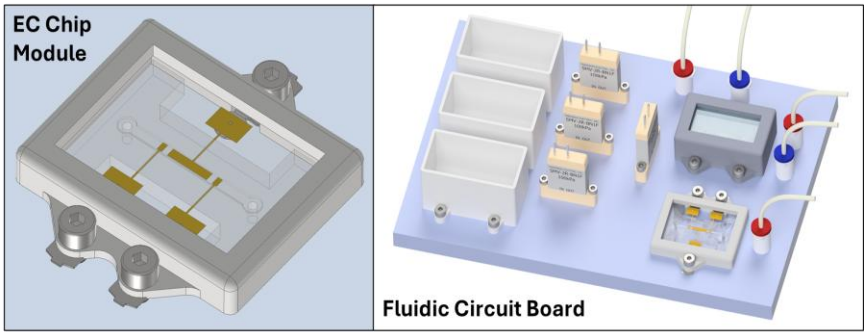


Tailor-Made Polymers for Dopamine Detection

MIPs are synthetic materials with recognition sites that mimic natural molecules like antibodies, allowing selective binding to target molecules. In this study, our team at the ODTÜ MEMS Center synthesized MIP structures explicitly for the sensitive detection of dopamine. The TEM images reveal a well-defined morphology, indicative of successful synthesis. The polymer particles exhibit a relatively uniform size distribution, with an average particle size estimated to be 30-35 nm. The lack of significant agglomeration indicates good colloidal stability.

Design of the Fluidic Circuit Board (FCB)

The Cell Chip Module and the Electrochemical Sensor Chip Module to mount the chips on the FCB are designed. Reservoirs are designed, valves and connection ports are chosen. ISO 22916:2022(E) and Translational Organ-on-chip Platform (TOP) Design Rules were followed whenever applicable.



This month, we had a productive Advisory Board meeting, discussing the latest OrChESTRA project updates. We received valuable feedback from our esteemed board members: Vania Silverio (University of Lisbon), Fabiana Arduini (University of Rome Tor Vergata), Andries van der Meer (University of Twente), Paul Vulto (MIMETAS), and Martinus Gijs (EPFL)

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